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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,594	02/26/2004	Takao Inoue	MAM-038	4338

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EXAMINER

PARSONS, THOMAS H

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/786,594	Applicant(s) INOUE ET AL.	
	Examiner Thomas H. Parsons	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7 and 9-13 is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

This is in response to the Amendment filed 3 August 2006.

(Previous) DETAILED ACTION

Specification

1. The objection to the disclosure because of minor informalities has been **withdrawn** in view of Applicants' Amendment.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6 **stand** rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (4,578,327) in view of Shoji et al. (5,650,244).

Claim 1: Saito et al. in Figure 2 discloses nonaqueous electrolyte battery comprising a positive electrode (5) including carbon fluoride as an active material, a negative electrode (2) including calcium as an active material, and an electrolyte (abstract, col. 1: 10-16, col. 2: 41-45, col. 5: 10-36).

Saito et al. do not disclose an electrolyte including an imide salt of calcium or a sulfonic acid salt of calcium.

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Shoji et al. disclose an electrolyte including an imide salt of calcium or a sulfonic acid salt of calcium (abstract and col. 1: 50-67 and col. 2: 28-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electrolyte of Saito et al. by incorporating the imide salt of calcium or a sulfonic acid salt of calcium of Shoji et al. because Shoji et al. teach imide salt of calcium or a sulfonic acid salt of calcium that would have suppressed the reaction (self-discharge) of the electrolyte, thereby improving the storage stability (col. 1: 38-43 and col. 3: 3-8).

Claim 2: The rejection is as set forth above in claim 1 wherein further Shoji et al. disclose that the imide salt of calcium is a sulfonyl imide salt of calcium (col. 1: 56-57 and col. 2: 33).

Claim 3: The rejection is as set forth above wherein further Shoji et al. disclose that the sulfonyl imide salt of calcium is an alkylsulfonyl imide salt of calcium (col. 1: 56-57 and col. 2: 33).

Claim 4: The rejection is as set forth above wherein further Shoji et al. disclose that the electrolyte includes calcium bis(trifluoromethylsulfonyl) imide, $\text{Ca}[\text{N}(\text{CF}_3\text{SO}_2)_2]_2$ (col. 1: 56-57 and col. 2: 33).

Claim 5: The rejection is as set forth above wherein further Shoji et al. disclose that the sulfonic acid salt of calcium is an alkylsulfonic acid salt of calcium (col. 1: 56 and col. 2: 32).

Claim 6: The rejection is as set forth above wherein further Shoji et al. disclose that the alkylsulfonic acid salt of calcium is calcium trifluoromethanesulfonate, $\text{Ca}(\text{CF}_3\text{SO}_3)_2$ (col. 1: 56

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and col. 2: 32).

Claim Rejections - 35 USC § 102

4. The rejections of claims 7 and 13 under 35 U.S.C. 102(b) as being anticipated by Roche et al. (3,980,495) have been **withdrawn** in view of Applicants' Amendment.

Claim Rejections - 35 USC § 103

5. The rejections of claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roche et al. as applied to claim 7 above, and further in view of Shoji et al. (5,650,244) have been **withdrawn** in view of Applicants' Amendment.

Response to Arguments

6. Applicant's arguments with respect to the rejections of claim 1-6 filed 3 August 2006 have been fully considered but they are not persuasive.

The Applicants argue, "...the rejection is improper because a person of ordinary skill in the art could not have reasonably predicted the results of using the electrolyte of Shoji in the battery of Saito. The battery of Shoji uses a negative electrode with lithium as the active material and a positive electrode in which the active material is exemplified by metal oxides and metal sulfides that contain at least one transition metal selected from manganese, cobalt, nickel, vanadium, iron and niobium. There is nothing in the prior art to suggest and the Office has not shown by proper evidence or reasoning that the results obtained by Shoji using a nonaqueous electrolyte containing a calcium salt in a battery in which the negative electrode includes lithium

as an active material and the positive electrode is limited as described above would be expected to be obtained in the battery of Saito in which the positive electrode includes a carbon fluoride as an active material and the negative electrode includes calcium as an active material.”

In response, Saito et al. in col. 5: 10-18 disclose that the negative electrode includes alkali metals and alloys thereof such as calcium and Li (which are preferred) with lithium being the most preferred as the active material. Further, Saito et al. in col. 5: 19-36 disclose that the electrolyte which can be employed in the electrolytic cell of the present invention depends upon the negative electrode active material (i.e. the choice of electrolyte is a function of the negative electrode active material).

Like Saito et al., Shoji et al. disclose a negative electrode with lithium alloys as the active material and that the materials of the components constituting the battery (i.e. the active material of the positive electrode) is not specifically limited. Further, Shoji et al. teach the same electrolyte (same solvent, same solute) as Saito et al. but Shoji et al.'s electrolyte includes the addition of an imide salt of calcium or a sulfonic acid salt of calcium.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electrolyte of Saito et al. by incorporating the salt of Shoji et al. because both teach the same electrolyte (i.e. same solute, same solvent) and the same negative electrode active material (Li alloy), and Shoji et al. teach that the addition of an imide salt of calcium or a sulfonic acid salt of calcium would have suppressed the reaction (self-discharge) of the electrolyte at the negative electrode, thereby improving storage ability.

Even though the Saito et al. combination uses Li alloy as the negative electrode active material, Saito et al. discloses that calcium is preferred. Therefore, the imide salt of calcium or a

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sulfonic acid salt of calcium of Shoji et al. could be equally added to an electrode active material including calcium.

Allowable Subject Matter

7. Claims 7 and 9-13 are allowable over the prior art references of record.

Reasons for Allowance

8. The following is a statement of reasons for the indication of allowable subject matter:

Roche et al. disclose a nonaqueous (molten) electrolyte secondary battery comprising a positive electrode including sulfur as an active material, a negative electrode including calcium as an active material and an electrolyte including a calcium salt wherein the electrolyte is a molten salt electrolyte comprising a mixture of alkali metal halides and alkaline earth metals including at least one calcium salt for providing calcium ions.

Shoji et al. disclose a nonaqueous electrolyte secondary battery comprising a negative electrode including lithium as an active material and an electrolyte including a lithium electrolyte salt and a calcium salt wherein the addition of the calcium salt suppresses decomposition of the electrolyte at the negative electrode which uses lithium as active material.

Roche et al. is not concerned with suppression the decomposition of the electrolyte at the negative electrode which uses lithium as active material. Roche et al. employs a negative electrode including calcium in the present of an alkali metal halide-alkaline earth metal mixture.

Therefore, one skilled in the art would not be motivated to combine the lithium electrolyte salt of Shoji et al. with the molten salt electrolyte of Roche et al.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Thomas H Parsons
Examiner
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